

INDOOR TILAPIA FISH FARMING DEMONSTRATION

TR-1138752

SUMMARY

The objectives of this project were to demonstrate and economically evaluate the Cornell University water reuse technology as applied to the production of tilapia; provide management and design guidelines for indoor technology; develop a potential Contract Grower instrument for contract growing; and to hold a workshop related to indoor water reuse technology. All objectives were completed satisfactorily. The report provides extensive data related to actual costs of construction, equipment selection and costing, and performance and cost analysis data for both market sized tilapia fish and for fingerling production.

Detailed discussion is provided on the impact of production scale on costs and performance. Indoor farms must become large scale on the order of 5 million lb. (2.3 x 10⁶ kg) per year of production to compete successfully in the fresh fillet market or remain small scale (50,000 lb. (2.3 x 10⁴ kg) per year selling on a whole fish basis) and market their product directly to the end consumer, e.g. restaurants or home consumers. At the commercial scale, production costs must approach or go below \$0.50/lb (\$1.10/kg); costs associated with filleting can be a very large fraction of over-all product delivered cost. Analysis strongly indicates that commercial viability can only be achieved by incorporating automated processing into the overall fillet process. Such an approach would reduce the cost of filleting to less than \$0.20/lb (\$0.44/kg) fillet basis once 5 million lb. (2.3 x 10⁶ kg) of whole fish were being processed on a yearly basis; this is in sharp contrast to hand filleting operations that would cost in excess of \$1.00 per lb. (\$2.20 per kg) fillet basis and as high as \$1.75 per lb. (\$3.86 per kg) fillet basis due to the overall slow rate of filleting, e.g. 2 minutes per fish.

Graphs and charts are provided in the report related to tilapia growth rates and feeding schedules, fillet yields, condition factors, and equipment electrical demands. Adaptation of fluidized sand beds and general design recommendations are provided. The Appendix includes a paper related to the application of round tanks and their advantages for intensive aquaculture applications. Finally, discussion is provided around the economic viability of indoor aquaculture and a tentative contract agreement between a large integrated firm and individual contract growers is presented. A Water Reuse Systems workshop was conducted June 23-27, 1998 and focused exclusively on engineering technology. This workshop is now an annual event.